

- (i) A constant airspeed;
- (ii) A constant amount less than power-on  $V_{NE}$ ; or
- (iii) A constant airspeed for a portion of the altitude range for which certification is requested, and a constant amount less than power-on  $V_{NE}$  for the remainder of the altitude range.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c), Dept. of Transportation Act (49 U.S.C. 1655(c)))

[Amdt. 29-3, 33 FR 971, Jan. 26, 1968, as amended by Amdt. 29-15, 43 FR 2327, Jan. 16, 1978; Amdt. 29-24, 49 FR 44440, Nov. 6, 1984]

#### § 29.1509 Rotor speed.

(a) *Maximum power-off (autorotation).* The maximum power-off rotor speed must be established so that it does not exceed 95 percent of the lesser of—

- (1) The maximum design r.p.m. determined under § 29.309(b); and
- (2) The maximum r.p.m. shown during the type tests.

(b) *Minimum power-off.* The minimum power-off rotor speed must be established so that it is not less than 105 percent of the greater of—

- (1) The minimum shown during the type tests; and
- (2) The minimum determined by design substantiation.

(c) *Minimum power-on.* The minimum power-on rotor speed must be established so that it is—

- (1) Not less than the greater of—
  - (i) The minimum shown during the type tests; and
  - (ii) The minimum determined by design substantiation; and
- (2) Not more than a value determined under § 29.33 (a)(1) and (c)(1).

#### § 29.1517 Limiting height-speed envelope.

For Category A rotorcraft, if a range of heights exists at any speed, including zero, within which it is not possible to make a safe landing following power failure, the range of heights and its variation with forward speed must be established, together with any other pertinent information, such as the kind of landing surface.

[Amdt. 29-21, 48 FR 4391, Jan. 31, 1983]

#### § 29.1519 Weight and center of gravity.

The weight and center of gravity limitations determined under §§ 29.25 and 29.27, respectively, must be established as operating limitations.

#### § 29.1521 Powerplant limitations.

(a) *General.* The powerplant limitations prescribed in this section must be established so that they do not exceed the corresponding limits for which the engines are type certificated.

(b) *Takeoff operation.* The powerplant takeoff operation must be limited by—

- (1) The maximum rotational speed, which may not be greater than—

- (i) The maximum value determined by the rotor design; or

- (ii) The maximum value shown during the type tests;

- (2) The maximum allowable manifold pressure (for reciprocating engines);

- (3) The maximum allowable turbine inlet or turbine outlet gas temperature (for turbine engines);

- (4) The maximum allowable power or torque for each engine, considering the power input limitations of the transmission with all engines operating;

- (5) The maximum allowable power or torque for each engine considering the power input limitations of the transmission with one engine inoperative;

- (6) The time limit for the use of the power corresponding to the limitations established in paragraphs (b)(1) through (5) of this section; and

- (7) If the time limit established in paragraph (b)(6) of this section exceeds 2 minutes—

- (i) The maximum allowable cylinder head or coolant outlet temperature (for reciprocating engines); and

- (ii) The maximum allowable engine and transmission oil temperatures.

(c) *Continuous operation.* The continuous operation must be limited by—

- (1) The maximum rotational speed, which may not be greater than—

- (i) The maximum value determined by the rotor design; or

- (ii) The maximum value shown during the type tests;

- (2) The minimum rotational speed shown under the rotor speed requirements in § 29.1509(c).

- (3) The maximum allowable manifold pressure (for reciprocating engines);